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ABSTRACT

The behavior of a person selecting a set of friends from a larger set of acquaintances can be analyzed as a consumer choice problem. The person can be regarded as a consumer allocating his income among a set of goods which he must purchase in quantities which will maximize his utility. An increase in utility can come either from an increase in expenditure or from a better allocation of resources. Results of an unlimited-choice sociometric questionnaire administered to 1204 boys at eight junior high schools showed that the size of a boy's set of acquaintances was largely a function of the school's population turnover rate. Well-liked boys received the same number of choices as others, but had a higher proportion of reciprocated responses. It appears that social success results from lower costs of obtaining information about potential friends and better allocation of effort, rather than from making contact with more people. References are included. (Author)

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A Microeconomic Model of Sociometric Choice [1]

Richard C. Roistacher
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University of Illinois

One consensus of research on adolescence is that adolescents tend to run in packs, and that the peer group exerts a strong influence on adolescent socialization and psychological development. In this paper, a model of consumer choice is used to explain some sociometric results concerning peer structures among junior high school boys. The model was originally applied to a consumer who must allocate his income among a stock of goods so as to purchase that mixture of goods which will yield him the most satisfaction. A junior high school boy can be viewed as having a budget of time or effort which he invests in learning about and associating with his peers. This paper will discuss some factors which determine the size of the set of peers from which a boy chooses his friends and a consumer choice strategy which describes a more successful selection by some boys.

The adolescent, the peer group, and the school.

The adolescent peer group can be described as a world in transition between a period of dependency and one of autonomy. The peer group supports both conformity to and deviation from social norms.

The school serves the adolescent primarily as a place for interacting with peers. The student's main social task is to develop and elaborate a network of peer relations, rather than to learn to interact with adults. Long, Ziller, and Henderson (1968) investigated the self-esteem of 420 students in grades six through twelve. Using a primarily perceptual measure, they found that dependency, (seeing one's self as a part of the group rather than as a separate entity), increased until the ninth grade and then decreased. Douvan and Adelson (1966) reported that the adolescent peer group did not support the testing of new identities, but pushed for conformity and hindered the differentation of self. Coleman (1961) found that self-esteem was closely linked to peer group membership and to social status. The values of "leading cliques" centered far more on athletic and social skills than on academic excellence. Indeed, the label "brilliant student" was often applied to low-status individuals outside the leading cliques who were not necessarily the best students, but who had failed to distinguish themselves in areas more important to their peers. Coleman suggests that students

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Roistacher (1972) obtained similar results in an investigation of 575 boys at four junior high schools. Members of large central cliques reported significantly more participation in athletics than did boys in smaller cliques. In addition, the grade point averages of the large-clique members were significantly higher than those of non-members. The congruence between school norms and the norms of leading cliques is indicated by the fact that members of large cliques in the four schools rated participitation in school activities as conferring more status than did non-members. This was true even for large-clique members who did not take part in such activities.

The peer group thus exerts considerable influence on the development of adolescents. Interaction with peers appears to be crucial in determining the adolescent's attitude toward the school and toward his psycho-social development in the school. Successful progress through adolescence is associated with strong and meaningful group contacts which, in general, reinforce the norms of adult society.

Large scale sociometric analysis.

Sociometric investigators have generally constrained either the size of the group or the number of choices a respondent is allowed to make because sociometric data sets tend to grow unmanageably large as either parameter is allowed to increase. Davis (1970), in a study of 901 sociomatrices collected by several investigators, reported that the 489 sociometric groups ranged in size from 3 to 80, with 45% from 10 to 19, and 27% from 20 to 29.

Caxton and Horvath (1971) reported a study of a large sociogram of 960 high school students, where they limited the number of choices a respondent could make to eight. They developed a model which used sequential choice probabilities as a measure of social distance, finding that the probability of two respondents choosing each other at a given level of friendship could be predicted from two variables: the probability of being mutually chosen at all, and a variable related to the size of the average respondent's circle of friends. Since the model described friendship choices in a school as a whole, it suggested that the variance in the number of friends a student has is largely explained by group rather than individual characteristics.

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Method

A sociometric questionnaire was administered to 1204 eighth grade boys at eight Detroit-area junior high schools. Each sociometric group, consisting of all eighth grade boys in a school, had from 128 to 202 members.

The questionnaire consisted of two booklets, each containing a roster of all eighth grade boys in a school, and two rating scales. The booklets included a two-point scale indicating whether the rater felt he knew the ratee well or just a little. The booklets also contained two seven-point scales on which the ratee could be rated as liked or disliked by the rater, and as similar to or different from the rater. Boys were instructed to rate as many of their classmates as they wished and to skip the names of those they felt they did not know well enough to rate. In order to control for presentation order effects, half of the booklets in each school were alphabetized in ascending order and half in descending order.

INSERT TABLE 1 ABOUT HERE

The usual instrument, on which a respondent is asked to write the names of his friends or the names of the members

of a leading crowd, was not appropriate to such large groups. A pilot study had shown that boys either refused to give any serious consideration to a questionnaire which required large amounts of writing, or would give extremely stereotyped sets of responses, often by copying each other's lists of names. Experience showed that a junior high school boy faced with a write-in questionnaire exhausts his patience long before he exhausts his list of acquaintances.

The booklets were designed so that choices could be made with a minimum of effort. It was hoped that boys would rate even those whom they did not know very well, since the discovery of best friends was to be accomplished by analyzing the rating scales, rather than by letting the respondents omit all but their best friends (and worst enemies). The result of using a roster, rather than a fill-in instrument was not only that boys made more choices, but that there was additional significance to the omission of a choice since memory and fatigue factors were largely controlled. Experience showed that a junior high school boy faced with a long write-in questionnaire exhausts his patience long before he exhausts his list of acquaintances. Boys filled out the booklets in special administration sessions held approximately two weeks apart. Most of them appeared enthusiastic about rating their

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The total number of choices received and median scores received on each of the scales were computed for each of the 1204 boys. The complexity and the developmental nature of the analysis made it impractical to obtain a full sociomatrix for each of the eight schools. Therefore, four of the schools were selected at random for a full analysis of choices given as well as choices received. Since the original matrices ranged from 38 to 87 percent full, the matrices of two- and seven-point ratings were transformed into sparser matrices of ones and zeros representing "pair links."

First, the distribution of "liking" ratings each boy gave was normalized around its median value in order to control for individual tendencies to rate consistently high or low. Boys were considered pair-linked if each of them reported knowing the other well and if each rated the other above his median in liking. The normalizing and filtering process produced symmetric binary matrices which were from 11 to 15 percent as dense as the raw data matrices.

The binary pair-link matrix can also be considered as the adjacency matrix of an undirected graph of points representing boys, connected by lines representing relatively strong mutual choices. A sociometric clique was defined as a maximal complete subgraph, a completely linked set of boys which was not contained in a larger completely linked set. Since the set of pair-links was still relatively dense, the number of cliques in each school far exceeded the number of boys. The large overlap among cliques made it impractical to partition the groups into non-overlapping cliques. Instead, all maximal complete subgraphs were extracted and each boy's largest clique was determined.

A number of indices of social connectivity were derived for each respondent in the four schools for which complete sociomatrices were constructed. These indices included the total number of choices a respondent gave and received, the proportion of raters who reported knowing a respondent well, the number of pair links and cliques of which a respondent was a member, and the ratio of pair links to choices given and received.

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Population turnover and the size of acquaintance sets.

The most striking result was that boys in the inner-city schools tended to choose and be chosen by only half as many of their peers as did boys in suburban schools. Comparison of tables 1 and 2 shows that the numbers of choices given and received were unrelated to eighth grade class size, and were roughly inversely related to total school size. In the four schools in which full results were obtained, the number of choices a respondent received correlated .741 with the number he gave. Since the inner-city schools differed from the suburban schools in location, racial composition, socioeconomic status and turnover rate, it was not possible to isolate and test the effect of each of these variables between schools.

An analysis of variance showed that within any given school there was no significant relation between a student's socioeconomic status (as measured by Duncan's (1961) socioeconomic status index), or his relative mobility (as measured by the number of schools he had attended) on any of the indices of social connectivity. Students who had spent their entire junior high school careers in a single high turnover school had about the same number of acquaintances as did students in the same school

who had attended two or more secondary schools. Highly mobile students in low turnover schools tended to know and be known by about the same number of others as did other boys in these schools, i. e., about twice as many others as in the inner-city schools.

INSERT TABLE 2 ABOUT HERE

Although the data indicate that individual mobility and socioeconomic status do not significantly affect the friendship patterns of an individual within a given school, it appeared that the average turnover rate in a school as a whole might have a significant effect on the number of others to whom an individual was related. It was assumed that the number of others an individual would know should tend to increase as the number of people in his immediate vicinity increases, and should in the long run tend to decrease to the extent that current members of the group leave his vicinity and are replaced by new members. (If the observation of people leaving and arriving is made over a unit interval of time, then these figures are immediately expressable as rates.)

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$a(1) >= 0$; $a(2)$, $a(3) <= 0$; where T is the total number of people in the group, L the number of current members who leave and C the number of new members who arrive during a unit period of time. Since the only available estimate of L and C was a school's annual turnover rate, obtained from the Board of Education, it was assumed that L and C were approximately equal. Equation 1 can then be written as

(2) $$K = a(1)T + a(2)TE + a(3)TE$$

where E is the annual turnover rate in the student population. Since there was no way to estimate a(2) and a(3) directly, they were combined and T factored out so that the model could be written as

(3) $$K/T = [a(2) + a(3)]E + a(1).$$

This is now a linear model in one variable which states that the proportion of the group that an individual should know or be known by is a linear function of the group's

turnover rate. Accordingly, a linear regression was performed with the school's annual turnover rate as the independent variable and the proportion of eighth grade boys choosing a respondent as the dependent variable.

Table 3 shows that this model explained 56% of the variance in the number of respondents who chose a boy. Another regression was performed using as the dependent variable the proportion of the class who reported knowing an individual well, which ranged from 31 to 46 percent of those who reported knowing him at all. Over all eight schools, 35% of those rating a boy reported knowing him well. Table 3 shows that the model explained 63% of the variance in the proportion of the class reporting knowing a boy well. The constants in the regression equations are both in the direction predicted in the statement of the model. An additional regression in which a term was added to partial out the inner-city schools from the suburban schools explained only an additional 1% of the variance.

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These results indicate that the size of a boy's set of acquaintances in these four junior high schools is largely explained by the rate of turnover in the student body. It appears that the number of others a boy knows is significantly determined by a school-wide norm, as well as by his individual proclivities for making friends. Regardless of his personal mobility, the individual tends to adopt the friendship patterns of his new environment. Patterns of friendship are largely a function of aggregate mobility in the student body, but are largely independent of the individual mobility which totally determines aggregate mobility.

A Consumer Choice Model of Friendship Formation

A student's task in selecting a set of acquaintances from his peers can be expressed as a problem in consumer choice. The consumer choice problem is one of allocating a fixed stock of resources among a set of purchases in a way which yields the greatest utility to the consumer. In this case, the resource is a boy's time (or effort) which is to be allocated among a set of schoolmates in a way which will yield him the most satisfaction.

A consumer choice model of friendship selection has four parts:

1. A set of acquaintances from whom the individual will choose his friends.

2. A utility function relating the satisfaction received from associating with a particular person to the amount of time or effort spent in associating with him.

3. A set of costs of information about the set of utility function described in (2).

4. A specification of the total amount of time or effort which the person has available for forming friendships.

The utility function.

Assume that a boy, p, is faced with the task of selecting a set of friends from a larger set of schoolmates. For each schoolmate, q, there is a function, d[t(p,q)], which relates a total amount of p's investment of effort, t(p,q), to p's total amount of utility from that level of effort.

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The student, p, invests an amount of time or effort, t(p,q), in interacting with q and receives u(p,q) = d[t(p,q)] as a return for his total amount of effort. Rationality dictates that p attempts to maximize U(p), his total utility, where

(4) $$U(p) = \sum_{i=1}^{k} u(p,i)$$

the total amount of liking he receives from k others as a result of investing effort in knowing them.

According to the usual criteria of economic "rationality," p should be interested in spending time and effort in interacting with the person, q, for whom the marginal value of d is presently greatest. That is, at a single point in time, p should want to interact with the other person will yield the greatest increment of satisfaction for the next increment of effort. It can be shown that, once the value of d[t(p,q)] is known for all q and for all levels of t(p,q), there is a strategy which will maximize U(p) for any total amount of
Constraints on available resources.

* One reasonable constraint on p is that his supply of effort is limited, i. e.,

(5) SUM(i=1,K) t(p,i) <= 1

where t is the proportion of p's available time spent on interacting with q.

The data, however, indicate that p must meet an additional criterion, that of knowing and being known by at least k* other boys in the school, where k* is a function of the school's rate of student turnover. Thus, p's problem is to maximize U(p) subject to the constraint of inequality (5) and the additional constraint that k >= k*. Although there may be some boys who are universally liked, it is probable that the average boy will make contact with people who either do not like him well or who actively dislike him in the course of satisfying the constraint inequality. Another constraint is that there is a non-trivial cost to p in time and effort for learning the shape and values of d[t(p,q)]. It seems safe to assume that no one has sufficient supplies of time and effort so that there are no constraints on his ability to make friends.

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The minimum amount of effort, say m(p,q), needed for p to determine the form, or at least the marginal value of d[t(p,q)], will vary over individuals p and q. However, when inviduals are selecting friends from the same group, it can be assumed that m(p) averages out across the other individuals in the group and is thus a function only of p, the chooser. Call this minimum effort m(p).

In order to know k* other boys, p must invest (k*)(m(p)) in time or effort before he can gain a return from a full set of friends. Thus, whatever system he uses to allocate his investment in friends, a lower value of m(p) leaves more effort available to be invested in friendship. A boy, p, with a lower value of m(p) will be able to invest more effort in interacting with friends who will yield a higher return in satisfaction.

The process of investigating potential friends is obviously not a one-way affair. The activities which convey information about q to p also convey information about p to q. However, where m(p) is much smaller than m(q), it is possible for p to become sufficiently informed about q without the reverse being true.

This model generates several predictions about the data. A higher level of utility, i. e., social success, might come either from a higher level of effort invested in friendships or from a more effective use of effort. A higher level of effort would be reflected in successful boys' having more friends then other boys. If social success is a result of being more sensitive to the form of the return function, d[t(p,q)], then successful boys should have a higher return per friend. Their lower values of m(p) will leave them with more energy to invest, while their greater efficiency in determining returns allows them a higher return on their effort. If it is assumed that the process of investigating the return from a potential friend transmits information to both parties, then the boy with the lowest value of m(p) will tend to break off an unsuccessful contact first. As a result, boys with relatively high thresholds, i. e., those with high values of m(p), will tend to be better known to those who like them less. The more discriminating boy will have completed his initial investigation and broken off the contact before the less discriminating boy has gained enough information from the contact to be satisfied that he knows the former boy well.

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Friendship Choice Strategies of Successful Boys

Results in four schools.

An analysis of variance showed that at each of the four junior high schools, boys who were rated above the school median on the liking scale tended to receive approximately the same number of choices as did boys who were less well liked by their peers. Table 4 shows that the number of choices a boy gives is positively associated with his being reported as well liked. However, tables 5 and 6 indicate that the degree to which a boy is liked is far more strongly associated with the number of pair links he forms, both in absolute numbers and as a proportion of the choices he gives. The school norm concerning how many others a boy should know has progressively less effect in tables 4, 5, and 6, while the degree to which he is liked has progressively more effect. There is no large interaction in any of the three analyses, indicating that the effect is much the same in all of the four schools.

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Table 7 indicates that the median liking rating a boy received was also positively associated with the size of his largest clique, a fact which is especially significant because the size of a clique increases approximately as the square root of the number of pair links required to form it.

INSERT TABLE 7 ABOUT HERE

Although well-liked boys were members of larger cliques, these cliques represented a relatively smaller proportion of the others to whom they were pair linked. A boy's "concentration" was defined as the number of others in his largest clique divided by the total number of his pair links. In three out of the four schools, a boy's median liking rating was negatively associated with his concentration index. Thus, well liked boys did not gain their higher ratings simply by restricting their relations to a single tight clique of mutual admirers.

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Most of the indices of connectivity are higher for well-liked boys, who make more reciprocated choices, and who are members of more and larger cliques. Table 8, however, shows that as a boy's median liking rating increases, the proportion of raters who report knowing him well decreases. Well-liked boys receive no more choices than do others, but reciprocate a higher proportion of those choices. The number of choices a boy gives and receives is far greater than the number of pair links he forms. The majority of those who rate a given well-liked boy, who does not return their choices, report knowing him less well than they report knowing others who do not reciprocate their choices.

INSERT TABLE 8 ABOUT HERE

Discussion

The data indicate that boys who are reported as well liked have about the same number of acquaintances as other boys, but are more accurate in their perception and identification of other boys who like them well. According to the model of consumer choice, a consumer can increase his total utility either by spending more or through a better allocation of resources among the available choices.

In order for p to receive a return from knowing q, it is necessary that q like p, and sufficient that p spend time associating with q, whom he likes. In terms of the sociometric data, a high rate of return to p from a relationship with q would be expressed by q's liking p and by p's knowing q well. The data show that a higher proportion of the peer relations of well-liked boys meet these criteria a forteriori by qualifying as pair links. Tables 4, 5, and 6 show that better-liked boys had a higher rate of return on their investment of effort in peer relations by having a larger number of pair links, both absolutely and as a proportion of choices given and received.

If being well liked were the result of a higher expenditure of effort, then well-liked boys would tend to give and receive significantly more choices than less successful boys. The data show, however, that the number of choices given and received in a school is related to turnover rate in the student body.

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Table 8 shows that the median liking rating a boy receives is inversely related to the proportion of raters who report knowing him well, a result related to the lower information costs incurred by well-liked boys. According to the model, the well-liked boy forms more pair links but is reported as known well by a smaller proportion of his acquaintances because he has been more successful in identifying those other boys who will like him especially well. The well-liked boy concentrates his effort on relating to a selected set of peers rather than diffusing his effort more widely across his set of acquaintances.

Well-liked boys' membership in larger cliques indicates that their liking relationships tend to be more transitive than is the case for boys who are less well liked. If a well-liked boy, p, likes boys o and x, then o and x tend to like each other more than is the case where p is less well-liked. One possble reason for this increased transitivity is that well-liked boys, by concentrating their effort on boys who like them, serve as links between boys who will tend to like each other.

Suppose boys are represented as points in what Coombs (1968) calls a joint evaluation space. The dimensions of the space in Figure 1 represent attributes identification of those who will like them well. physical attractivness, intelligence, etc. Point p in Figure 1 represents the position occupied by individual p's ideal friend. The closer in the space that another point, q, lies to point p, the more individual p will like individual q, i. e., the higher the value of d[t(p,q)] for a given value of t(p,q), and the higher the probability of a pair link existing between the two. Boys who are more accurate in their perception of who will like whom, i.e. of the positions of points in the evaluation space, will tend to give more choices to others who lie close to their own ideal point. In Figure 1, p is shown as pair linked to four other boys. Boy p's pair links have been distributed more densely to boys lying close to him in the evaluation space. Boys lying relatively close to p also lie close to each other and thus have a higher probability of being pair linked to each other. Boy a is too distant from p to be linked to any of the other boys who are linked to p. Boy b is close enough to be linked to both p and c, while points c. d, and e are sufficiently close to p and to each other to be completely linked. By making sufficiently many choices a less discriminating boy, q, may form as many pair links as boy p, but those to whom q is linked are not as likely to be

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Conclusions

The theory of consumer demand provides a useful strategic model for investigating friendship choices in large groups. It is especially interesting that one of the model's major parameters, the set of choices, is so heavily constrained by group rather than individual factors. The consumer choice model, in both economics and in the current context, is a strategic model rather than a model of internal processes in the individual. The utility function d[t(p,q)], assumes the existence of a set of preferences by the consumer, but says nothing at all about the form or content of his preferences. The model should therefore be consonant with any model of interpersonal attraction. The process by which boys choose friends is one of interpersonal attraction, but the strategies by which more successful boys choose is describable in microeconomic terms.

The use of a large unlimited-choice sociometric questionnaire yielded significant new quantitative information about social structures among adolescent boys over a varied set of environments. The use of a questionnaire which made it easy to make large numbers of nominations proved fortunate, for it revealed that the usual sociometric criterion of "overchoice" is heavily influenced by the design of the questionnaire. When a sociometric group is relatively large, (e. g., over 100), write-in questionnaires are probably effective in identifying the few others a respondent most prefers. However, they may not be adequate for recording the large number of others in the group whom the respondent knows or likes less well.

The patterns of acquaintance in the inner city differ substantially from those in suburbia in ways which are explainable in "ecological" terms. Turnover rate, an easily measured but seldom used parameter, has a powerful effect on interpersonal relations throughout the school. The lower information costs of well-liked boys indicates that there is an important cognitive component to social success in the junior high school. The boy with the requisite cognitive skills will obtain a higher level of utility from his social relations, regardless of the size of his set of acquaintances. The junior high school boy can be thought of

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as surrounded by a network of friends inside a much looser "cloud" of acquaintances. (The analogy which comes to mind is that of an electron cloud in an atomic structure.) The size of the cloud is heavily influenced by the rate of turnover in the high school's student body. The higher the rate of turnover, the fewer other boys are included in the cloud. Turnover in the student body affects the size of the individual's network of friends both directly by attrition, and indirectly by reducing the size of the population from which friends are selected.

The process of selecting friends is, of course, a mutual one. There is no such thing as an isolated active individual selecting friends from a passive set of acquaintances. However, this simplification of a complex process seems adequate to explain some of what is going on, and it would be possible to construct bialateral and multilateral versions of the choice model presented here.

These results raise some questions about the relation of population stability and its opposite to socialization and educational outcome. Junior high school boys are at a period in life when peer group orientation is at its highest. If population turnover in a school is very high, then boys in that school must spend extra effort to cope with the effects of such high turnover. It may be that one

of the functions of the immediate peer group in a high turnover population is to insulate the individual from the results of such turnover. If educational and socialization outcomes can be improved by shielding the student from the effect of turnover, then school systems should attempt such shielding when possible. One step would be to keep students in the same school throughout a school year when their families have moved to a nearby school district. It is too early to make such a recommendation, but the evidence indicates that further investigation of the effects of population turnover is in order.

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Table 1:

School	Location
1	Suburban
2	Suburban
3	Urban
4	Urban
6	Urban
7	Urban
8	Suburban
9	Suburban

Table 2: Number of
received by
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School	N	%	Me
1	127	10.6	88.
2	152	12.6	91.
3	202	16.8	42.
4	124	10.3	56.
6	133	11.1	53.
7	151	12.6	49.
8	168	14.0	104.
9	145	12.1	109.
Total	1202	100	73.

Total Sum of Squares =
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Sum Squares Between =
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F(7,1194) =
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Table 1: Demographic Characteristics of Eight Junior High Schools.

School	Location	School Size	Eighth Grade Class Size	Number of Boys tested	Mean Duncan S.E.S.	% White	Missing After One Yr.
1	Suburban	842	248	128	34.23	100	4.3
2	Suburban	1000	275	152	35.94	100	22.
3	Urban	1483	256	202	29.90	35	36.
4	Urban	1214	430	124	32.58	6	42.
6	Urban	1461	562	133	27.36	1	32.
7	Urban	1563	555	151	25.76	0	39.
8	Suburban	983	320	168	50.12	100	7.4
9	Suburban	1045	319	147	47.59	100	4.5

Table 2: Number of Nominations received by boys at eight junior high schools.

School	N	%	Mean	S.D.(Est.)
1	127	10.6	88.827	14.724
2	152	12.6	91.599	17.348
3	202	16.8	42.668	15.321
4	124	10.3	56.226	14.180
6	133	11.1	53.744	17.457
7	151	12.6	49.093	15.151
8	168	14.0	104.060	20.459
9	145	12.1	109.614	15.668
Total	1202	100	73.820	30.551

Total Sum of Squares = 1120973.
For 8 groups, ETA = .8429
Sum Squares Between = 796384.
Sum Squares Within = 324589.
F(7,1194) = 418.5
p << .001

Table 3: Linear Regression.

Dependent Variable: Proportion of eighth grade boys reporting knowing a respondent:	Well	At All
Standard Error of Estimate	.0595	.1414
F Ratio for the Regression	2115.506	1556.226
Correlation coefficient	.7988	.7514
Proportion variance explained	.6381	.5646
Residual D. F. (N-K-1)	1200	1200
Constant term	.3040	.7515
Independent Variable: School annual turnover rate.		
B	-.5334	1.0877
Sigma(B)	.0116	.0276
Beta	-.7998	-.7514
Sigma(Beta)	.0174	.0190

Table 4: Effect of median liking rating and school on the number of nominations a respondent made.

Liking Median	School 6	7	8	9
Below School Median	62.3333 (9)	33.8000 (10)	104.2500 (24)	117.3333 (18)
At School Median	60.8970 (68)	50.6102 (59)	120.9848 (66)	126.1912 (68)
Above School Median	71.8837 (43)	65.2381 (63)	130.7758 (58)	132.3333 (45)

	DF	Sum of Squares	Mean Squares	F Ratio
ANOVA Error	519	380500.	733.1	
Interaction	6	3698.	616.3	.841
School	3	566500.	188800.	257.663**
Liking Median	2	9245.	4623.	6.306**
Grand Mean	1	4698000.	4698000.	6409.

** p<.01

Table 5: Effect of m
the number of pair

Liking Median	6
Below School Median	14.3333 (9)
At School Median	18.2647 (68)
Above School Median	23.0465 (43)

	DF	Sum of
ANOVA Error	519	90040
Interaction	6	2297
School	3	52450
Liking Median	2	10230
Grand Mean	1	367300

* p < .05; ** p < .01

Table 6: Effect of med
number of pair link
percentage of the

Liking Median	6
Below School Median	22.5625 (8)
At School Median	29.5146 (68)
Above School Median	32.4139 (43)

	DF	Sum of
ANOVA Error	518	69260
Interaction	6	877
School	3	2953
Liking Median	2	5821
Grand Mean	1	417600

** p < .01

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	At All
595	.1414
06	1556.226
988	.7514
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4	1.0877
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4	.0190

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(59)	(66)	(68)
2381	130.7758	132.3333
(63)	(58)	(45)

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Table 5: Effect of median liking rating and school on the number of pair links a respondent established.

Liking Median	School 6	7	8	9
Below School Median	14.3333	7.8000	18.6667	26.1111
	(9)	(10)	(24)	(18)
At School Median	18.2647	12.8305	26.8485	37.1618
	(68)	(59)	(66)	(68)
Above School Median	23.0465	17.6032	39.9828	47.2000
	(43)	(63)	(58)	(45)

	DF	Sum of Squares	Mean Squares	F Ratio
ANOVA Error	519	90040.	173.5	
Interaction	6	2297.	382.9	2.207*
School	3	52450.	17480.	100.8**
Liking Median	2	10230.	5116.	29.49**
Grand Mean	1	367300.	367300.	2117.

* p < .05; ** p < .01

Table 6: Effect of median liking rating and school on the number of pair links a respondent established as a percentage of the number of nominations he gave.

Liking Median	School 6	7	8	9
Below School Median	22.5625	21.0700	18.5208	22.8166
	(8)	(10)	(24)	(18)
At School Median	29.5146	26.9711	22.4363	29.1587
	(68)	(59)	(66)	(68)
Above School Median	32.4139	28.3552	30.4499	35.8043
	(43)	(63)	(58)	(45)

	DF	Sum of Squares	Mean Squares	F Ratio
ANOVA Error	518	69260.	133.7	
Interaction	6	877.9	146.3	1.094
School	3	2953.	984.4	7.363**
Liking Median	2	5821.	2910.	21.77**
Grand Mean	1	417600.	417600.	3123.

** p < .01

Table 7: Effect of median liking rating and school on the size of the respondent's largest clique.

Liking Median	School 6	7	8	9
Below School Median	5.1111 (9)	4.4000 (10)	5.2083 (24)	5.0556 (18)
At School Median	6.0147 (68)	5.4576 (59)	6.0758 (66)	7.0882 (68)
Above School Median	7.1860 (43)	6.7460 (63)	7.8260 (58)	8.2000 (45)

	DF	Sum of Squares	Mean Squares	F Ratio
ANOVA Error	519	2554.	4.921	
Interaction	6	17.45	2.908	.591
School	3	144.6	48.20	9.795**
Liking Median	2	9245.	4623.	6.306**
Grand Mean	1	22770.	22770.	4627.

** p < .01

Table 8: Effect of median liking rating and school on the proportion of raters who reported knowing a ratee well.

Liking Median	School 6	7	8	9
Below School Median	.3443 (9)	.3309 (10)	.5361 (24)	.4624 (18)
At School Median	.3191 (66)	.3105 (59)	.4721 (66)	.4130 (66)
Above School Median	.2467 (43)	.2807 (63)	.4014 (58)	.3208 (43)

	DF	Sum of Squares	Mean Squares	F Ratio
ANOVA Error	517	3.679	.00711	
Interaction	6	.09162	.01527	2.146*
School	3	2.211	0.7371	103.663**
Liking Median	2	1.027	0.5136	72.18**
Grand Mean	1	69.85	69.85	9814.

* p < .05; ** p < .01

NOTE

[1] This research was sponsored by NI
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Figure 1: A configuration of points re
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24)	(18)
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	4627.

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61	.4624
4)	(18)
21	.4130
6)	(66)
14	.3208
8)	(43)

ares	F Ratio
711	
527	2.146*
71	103.663**
36	72.18**
	9814.

NOTE

[1] This research was sponsored by NIMH Grant RO1-MH15606 and by the Research Board of the University of Illinois.

CAPTION:

Figure 1: A configuration of points representing person p and five friends in a joint evaluation space.

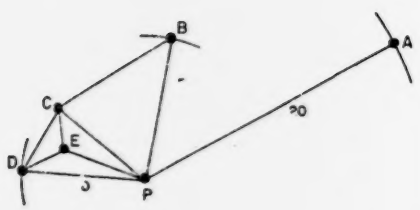

FIGURE 1